

**CLAIMS**

What is claimed is:

1. A method for measuring long-term arrival rates of data samples on an asynchronous transport network, the method comprising the steps of:
  - counting a known and predetermined number of data samples in a session;
  - measuring a time interval between the arrival of a first data sample and the arrival of a last data sample in said session; and
  - calculating a long-term average arrival rate of said data samples by dividing said known and predetermined number of data samples by said measured time interval of said session.
2. The method of Claim 1 wherein the data samples are contained within a plurality of data packets.
3. The method of Claim 1 wherein said session is a session with the largest number of said data samples in a set of sessions.

- 1 4. A method for synchronizing a first clock rate of a  
2 network clock to a second clock rate of a receiver  
3 clock on an asynchronous transport network, the method  
4 comprising the steps of:  
5 counting a known and predetermined number of data  
6 samples in a session;  
7 measuring a time interval between the arrival of a  
8 first data sample and the arrival of a last  
9 data sample in said session;  
10 calculating a long-term average arrival rate of  
11 said data samples by dividing said known and  
12 predetermined number of data samples by said  
13 measured time interval of said session;  
14 counting clock pulses output from said receiver  
15 clock to determine a value for said second  
16 clock rate;  
17 calculating a clock rate error variable, said  
18 variable being equal to the difference between  
19 said calculated long-term average arrival rate  
20 and said second clock rate of said receiver  
21 clock; and  
22 adjusting said second clock rate of said receiver  
23 clock by an amount equal to said clock rate  
24 error variable.
- 1 5. The method of Claim 4 wherein the data samples are  
2 contained within a plurality of data packets.
- 1 6. The method of Claim 4 wherein said session is a session  
2 with the largest number of said data samples in a set  
3 of sessions.
- 1 7. The method of Claim 4 wherein said long-term average  
2 arrival rate is an average rate of a number of  
3 different sessions.

1 8. The method of Claim 4 wherein said long-term average  
2 arrival rate is a time-weighted average of previous  
3 sessions.

1 9. The method of Claim 4 wherein the step of adjusting  
2 said second clock rate, having a frequency  $R$ , comprises  
3 dividing down said frequency  $R$  of said second clock  
4 rate by a factor  $Z$ , such that said adjusted second  
5 clock rate is  $R/Z$ .

1 10. A system for measuring long-term arrival rates of  
2 data samples on an asynchronous transport network, the  
3 system comprising:

4 means for counting a known and predetermined  
5 number of data samples in a session;

6 means for measuring a time interval between the  
7 arrival of a first data sample and the arrival  
8 of a last data sample in said session; and

9 means for calculating a long-term average arrival  
10 rate of said data samples by dividing said  
11 known and predetermined number of data samples  
12 by said measured time interval of said session.

1 11. The system of Claim 10 wherein the data samples are  
2 contained within a plurality of data packets.

1 12. The system of Claim 10 wherein said session is a  
2 session with the largest number of said data samples in  
3 a set of sessions.

1 13. A system for synchronizing a first clock rate of a  
2 network clock to a second clock rate of a receiver  
3 clock on an asynchronous transport network, the system  
4 comprising:

5 means for counting a known and predetermined  
6 number of data samples in a session;

7 means for measuring a time interval between the  
8 arrival of a first data sample and the arrival  
9 of a last data sample in said session;

10 means for calculating a long-term average arrival  
11 rate of said data samples by dividing said  
12 known and predetermined number of data samples  
13 by said measured time interval of said session;

14 means for counting clock pulses output from said  
15 receiver clock to determine a value for said  
16 second clock rate;

17 means for calculating a clock rate error variable,  
18 said variable being equal to the difference  
19 between said calculated long-term average  
20 arrival rate and said second clock rate of said  
21 receiver clock; and

22 means for adjusting said second clock rate of said  
23 receiver clock by an amount equal to said clock  
24 rate error variable.

1 14. The system of Claim 13 wherein the data samples are  
2 contained within a plurality of data packets.

1 15. The system of Claim 13 wherein said session is a  
2 session with the largest number of said data samples in  
3 a set of sessions.

1 16. The system of Claim 13 wherein said long-term average  
2 arrival rate is an average rate of a number of  
3 different sessions.

1 17. The system of Claim 13 wherein said long-term average  
2 arrival rate is a time-weighted average of previous  
3 sessions.

1 18. The system of Claim 13 wherein the step of adjusting  
2 said second clock rate, having a frequency R, comprises  
3 dividing down said frequency R of said second clock  
4 rate by a factor Z, such that said adjusted second  
5 clock rate is  $R/Z$ .

1 19. A machine-readable medium having embodied thereon a  
2 program, said program being executable by an electronic  
3 device to perform method steps for measuring and  
4 calculating long-term arrival rates of data samples on  
5 an asynchronous transport network, the method steps  
6 comprising:

7 counting a known and predetermined number of data  
8 samples in a session;

9 measuring a time interval between the arrival of a  
10 first data sample and the arrival of a last  
11 data sample in said session; and

12 calculating a long-term average arrival rate of  
13 said data samples by dividing said known and  
14 predetermined number of data samples by said  
15 measured time interval of said session.

1 20. The machine-readable medium of Claim 19 wherein the  
2 data samples are contained within a plurality of data  
3 packets.

1 21. The machine-readable medium of Claim 19 wherein said  
2 session is a session with the largest number of said  
3 data samples in a set of sessions.

1 22. A machine-readable medium having embodied thereon a  
2 program, said program being executable by an electronic  
3 device to perform method steps for synchronizing a  
4 first clock rate of a network clock to a second clock  
5 rate of a receiver clock on an asynchronous transport  
6 network, the method steps comprising:

7 counting a known and predetermined number of data  
8 samples in a session;

9 measuring a time interval between the arrival of a  
10 first data sample and the arrival of a last  
11 data sample in said session;

12 calculating a long-term average arrival rate of  
13 said data samples by dividing said known and  
14 predetermined number of data samples by said  
15 measured time interval of said session;

16 counting clock pulses output from said receiver  
17 clock to determine a value for said second  
18 clock rate;

19 calculating a clock rate error variable, said  
20 variable being equal to the difference between  
21 said calculated long-term average arrival rate  
22 and said second clock rate of said receiver  
23 clock; and

24 adjusting said second clock rate of said receiver  
25 clock by an amount equal to said clock rate  
26 error variable.

1 23. The machine-readable medium of Claim 22 wherein the  
2 data samples are contained within a plurality of data  
3 packets.

1 24. The machine-readable medium of Claim 22 wherein said  
2 session is a session with the largest number of said  
3 data samples in a set of sessions.

1 25. The machine-readable medium of Claim 22 wherein said  
2 long-term average arrival rate is an average rate of a  
3 number of different sessions.

1 26. The machine-readable medium of Claim 22 wherein said  
2 long-term average arrival rate is a time-weighted  
3 average of previous sessions.

1 27. The machine-readable medium of Claim 22 wherein the  
2 step of adjusting said second clock rate, having a  
3 frequency R, comprises dividing down said frequency R  
4 of said second clock rate by a factor Z, such that said  
adjusted second clock rate is  $R/Z$ .